



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
23.07.2008 Bulletin 2008/30

(51) Int Cl.:
A47B 45/00 (2006.01) **A47B 47/02** (2006.01)
A47B 87/02 (2006.01) **E04B 2/74** (2006.01)
F16B 2/22 (2006.01)

(21) Application number: **06732055.6**

(22) Date of filing: **18.04.2006**

(86) International application number:
PCT/JP2006/308127

(87) International publication number:
WO 2007/055040 (18.05.2007 Gazette 2007/20)

(84) Designated Contracting States:
DE ES FR GB IT

(30) Priority: **11.11.2005 JP 2005328139**

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(54) **STORING UNIT AND STORING STRUCTURE**

(57) In a storage unit (60) of a rectangular parallelepiped shape which is formed of a pair of horizontal panels (61) and a pair of vertical panels (62) that are connected with one another in an annular fashion, each of said horizontal panels (61) has a fitting groove (70) extending in a lateral direction thereof into which a part of a structural

member of a structural body into which the storage unit is built, and each of horizontal panels also has a positioning groove (71) extending in a lateral direction thereof into which a protrusion formed on a horizontal cover covering the one horizontal panel is fitted. As a result, it becomes possible to properly construct a storage space in accordance with the purpose of use of a user.

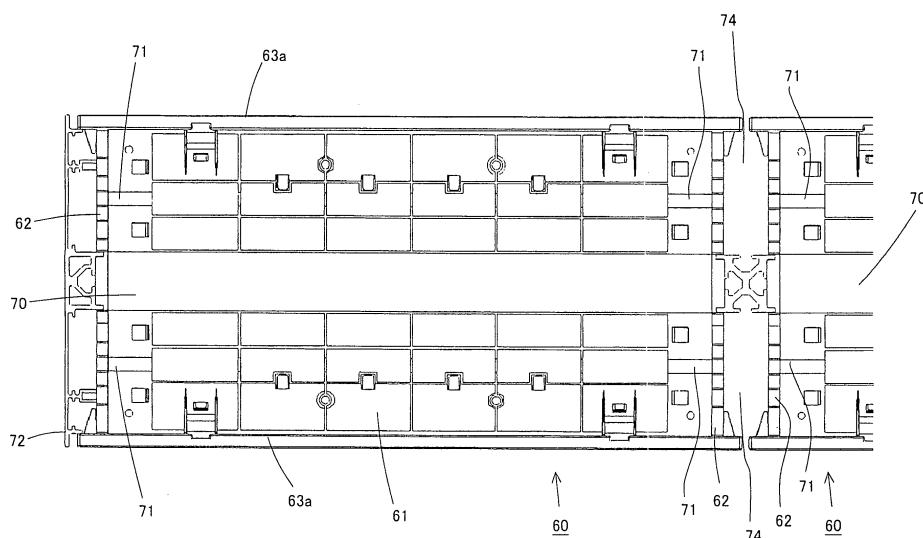


Fig.10

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a storage unit that receives information equipment, etc., used in an office, an exhibition hall, etc., to construct an appropriate storage space in accordance with the size of the office, etc., and to a storage structure constructed by such a storage unit.

2. Description of the Related Art

[0002] There has been disclosed a technique for a method of constructing a variety of kinds of spaces in offices, etc., for the purpose of conveniences to many people who use such spaces. For example, there has been disclosed a technique that provides, in combination with poles and frame members, a spatial structure that is robust and does not cause damage to the rooms in an office, etc. (see, for example, a Japanese patent application laid-open No. 2003-138771). In this technique, a minimum shared space structure is shown which is formed of three poles and two frame members that form an angle of 120 degrees therebetween.

[0003] In addition, there is also disclosed a technique utilizing unitized buildings in constructing a spatial structure (see, for example, Japanese patent application laid-open No. 2003-41689). Such a unitized building is generally constructed as follows. That is, most parts of a building body are produced in a factory, and then transported, after completion of foundation work, to a construction site by means of trucks or the like, where they are coupled and anchored to the foundation, and thereafter fitting and finishing work for necessary fixtures, furnishings, etc., is carried out. Also, in the above-mentioned technique, a duct space for wiring is defined in advance in a wall panel that constitutes the unit.

[0004] In a spatial structure provided for an office or the like, it is also important to construct a storage space for storing or receiving information equipment, etc., used in the office. In particular, objects to be stored or received in such a storage space vary in accordance with the purpose of use of the spatial structure, etc., so there is fear that the storage space, if always remaining constant or fixed, might become inconvenient to the user.

SUMMARY OF THE INVENTION

[0005] In view of the above-mentioned problems, an object of the present invention is to provide, upon construction of a storage space in a spatial structure, a storage unit for the storage space which is capable of constructing an appropriate storage space in accordance with the purpose of use of a user.

[0006] In order to solve the above-mentioned prob-

lems, according to the present invention, a storage structure for providing a storage space is constructed of unitized storage units. The storage unit is formed of four individual panels, each of which is provided with a groove for a specific purpose necessary to construct the storage structure. As a result, the construction of the storage structure according to the combination of storage units becomes easy, and the combination can be made arbitrary.

[0007] Specifically, a storage unit according to the present invention is in the form of a rectangular parallelepiped shape and is formed of a pair of horizontal panels and a pair of vertical panels that are connected with one another in an annular fashion. Each of said horizontal panels has a fitting groove extending in a lateral direction thereof into which a part of a structural member of a structural body into which said storage unit is built, and each of said horizontal panels also has a positioning groove extending in a lateral direction thereof into which a protrusion formed on a horizontal cover covering said one horizontal panel is fitted.

[0008] The storage unit according to the present invention is a minimum unit of a storage structure for receiving storage objects in a spatial structure, etc. Accordingly, by combining a plurality of such storage units in accordance with an arbitrary purpose such as the purpose of use of the storage unit in a spatial structure, it is possible to form a storage structure corresponding to the intended use of the user. In addition, this storage unit is composed of four detachable panels (two horizontal panels and two vertical panels), so at a stage prior to the construction of the storage structure, the space required for the prior accommodation of component parts can be suppressed small by storing the panels according to their kinds.

[0009] Here, two kinds of grooves including a fitting groove and a positioning groove are formed in said horizontal panels for individual purposes. When the storage unit is built in and used for the spatial structure (the above-mentioned structural body), the fitting groove provides a space into which structural members such as poles, etc., for supporting the storage unit are fitted and received. Accordingly, the storage unit can be constructed so as to accommodate the structural members thereby to form a storage structure, thus making it possible to ensure the strength of the storage structure, and the design is also excellent because the structural members exist in the places that are not apt to be noticeable from outside.

[0010] The positioning groove provides a space for positioning the horizontal cover in such a manner that the horizontal cover covering the surface of the horizontal panel is properly placed with respect to said horizontal panel. That is, the mounting position of the horizontal cover is decided by the protrusion on the horizontal cover and the positioning groove in the horizontal panel. This horizontal cover is mainly intended to improve the design of the appearance of the storage structure. In addition, the positioning groove is a groove that extends in the

lateral or horizontal direction of the horizontal panel. With this positioning groove, when the horizontal cover is attached to the horizontal panel, it is possible to fit the horizontal cover to the horizontal panel by making the protrusion of the horizontal cover slide into the positioning groove. Thus, the handling upon attachment of the horizontal cover becomes better.

[0011] Here, note that in the above-mentioned storage unit, each of said horizontal panels may have at least two positioning grooves which are in parallel to said fitting groove. Due to the horizontal arrangement of the fitting groove and the positioning grooves, the positioning of the horizontal cover after attachment of the storage unit to the storage structure can be easily done according to the operator's eye or visual sensation. Further, with the provision of at least two positioning grooves, the position of the horizontal cover with respect to the horizontal panel can be decided more accurately.

[0012] In the storage unit as stated above, in case where said protrusion has a joint portion that can be connected with an external member, said vertical panel may be covered with a vertical cover, and said external member may be connected with said joint portion, whereby said protrusion having said joint portion can be fitted into said positioning groove with said vertical cover being connected with said horizontal cover.

[0013] The vertical panel has its surface covered with the vertical cover, similar to the horizontal panel. Here, when the horizontal cover and the vertical cover are connected with each other, a positioning protrusion is used. For example, a screw is exemplified as an external member, and the horizontal cover and the vertical cover are connected with each other by the use of this screw. By arranging the thus connected locations within the positioning groove, both of the horizontal and vertical covers are fitted on the individual panels, respectively, with the horizontal cover being made as a reference. Thus, the connecting portions of the covers can be arranged in the place where eyes do not reach easily from the outside of the storage structure. As a result, the design value of the storage unit upon attachment of the horizontal cover and the vertical cover is not impaired, and the significance of existence of both covers is never reduced.

[0014] In the storage unit as stated above, when two of said storage units are arranged side by side with their vertical panels being in opposition to each other, there may be formed a clearance of a predetermined width between said vertical panels. That is, when the storage structure is constructed by the combination of the storage units, said clearance is formed which may be used for a prescribed purpose. The predetermined width that decides the size of this clearance is determined in accordance with the purpose of use given to said clearance. Accordingly, for example, in case where said clearance is used for the purpose of receiving power cables and signal cables of information equipment stored or received in the storage unit, the predetermined width may be to such an extent that those cables can be received in the

clearance. In addition, this clearance is formed between the vertical panels, so the situation in which said clearance is used (e.g., the condition of the cables received in the above-mentioned case) is in a state where eyes do not reach easily from the outside of the storage structure. As a result, the design value of the storage unit upon attachment of the horizontal cover and the vertical cover is not impaired, and hence the significance of existence of both covers is never reduced.

[0015] Here, as a storage structure formed by the storage units as stated above, there is exemplified one which is formed by arranging one or a plurality of said storage units in a horizontal direction and one or a plurality of said storage units in a vertical direction, wherein a common structural member of the storage structure is fitted into a fitting groove in a horizontal panel on an upper surface of each of at least one or a plurality of uppermost storage units, and another common structural member of the storage structure is fitted into a fitting groove in a horizontal panel on a lower surface of each of one or a plurality of lowermost storage units.

[0016] With the storage structure constructed in this manner, it is possible to put the combined storage units into a state where the storage units are firmly clamped vertically by means of said one structural member and the other structural member. In addition, the storage structure is constructed with the structural members being interposed, so the assembly thereof becomes easy. Here, note that supporting structural members may be arranged not only for the fitting grooves of the uppermost and lowermost storage units, but also for the immediate storage units arranged therebetween as well.

[0017] The above and other objects, features and advantages of the present invention will become more readily apparent to those skilled in the art from the following detailed description of a preferred embodiment of the present invention taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a view showing the schematic construction of a spatial structure into which a storage unit according to one embodiment of the present invention is built.

Fig. 2 is an external view of one of poles that form the spatial structure into which the storage unit according to the embodiment of the present invention is built.

Fig. 3 is a cross sectional view of the pole shown in Fig. 2.

Fig. 4 is an external view of one of beams that form the spatial structure into which the storage unit according to the embodiment of the present invention is built.

Fig. 5 is a cross sectional view of the beam shown

in Fig. 4.

Fig. 6 is an external view of one of small beams that form the spatial structure into which the storage unit according to the embodiment of the present invention is built.

Fig. 7 is a cross sectional view of the small beam shown in Fig. 6.

Fig. 8 is a view showing the schematic construction of a shelf built into the spatial structure shown in Fig. 1.

Fig. 9 is an exploded view showing the construction of the storage unit according to the embodiment of the present invention.

Fig. 10 is a top plan view of the storage unit according to the embodiment of the present invention.

Fig. 11 is a side view of the storage unit according to the embodiment of the present invention.

Figs. 12(a) and 12(b) are partial perspective views showing a horizontal cover and a vertical cover, respectively, which are coupled to the storage unit according to the embodiment of the present invention.

Fig. 13 is a view of a storage structure formed of storage units according to the embodiment of the present invention.

Fig. 14 is a view of a storage structure formed of storage units according to another embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] Hereinafter, an embodiment of a spatial structure for which storage units according to the present invention are used will be described based on the accompanying drawings. Fig. 1 is a view that shows the overall outline of a spatial structure 1. The spatial structure 1 is mainly composed of a plurality of poles 2a through 2j (hereinafter also referred to collectively as "poles 2") in the form of columnar or pillar shaped members, and a plurality of side or traversing beam members comprising large beams 3a through 3i (hereinafter also referred to collectively as "beams 3") and small beams 4a through 4c (hereinafter also referred to collectively as "small beams 4"). The poles 2 extend from a floor surface in a vertical direction so as to support the spatial structure 1, and the beams 3 and the small beams 4 extend horizontally with respect to the floor surface so as to connect between the poles 2 or between beams 3.

[0020] Specifically, the spatial structure 1 shown in Fig. 1 takes the form of a rectangular parallelepiped body, and has six poles 2a through 2f at four corners and at a near middle point of each long side, with the top portions of these poles 2a through 2f being connected with one another by means of seven beams 3a through 3g. In addition, a pole 2g is arranged in opposition to the front pole 2a in Fig. 1, with braces 5 being stretched between the pole 2a and the pole 2g. This pole 2g is connected with an intermediate portion of the beam 3a. Also, a small beam 4a extending horizontally with respect to the floor

surface is connected with lower portions of the pole 2a and the pole 2g. The strength of the spatial structure 1 is improved by means of the small beam 4a, the poles 2a, 2g, the beams 3 and the braces 5.

[0021] In addition, a pole 2h is arranged in opposition to the pole 2e, and is connected with an intermediate portion of the beam 3b. Two small beams 4b are connected between the pole 2e and the pole 2h, and a shelf 6 is arranged in a space enclosed by the small beams 4b and the poles 2e, 2h. Further, two poles 2i, 2j, being connected with intermediate portions of the beam 3d, are arranged between the poles 2c, 2d, and the lower portions of the poles 2c, 2i, 2j, 2d are connected with one another by means of the small beam 4c. In addition, a screen 7 is formed between the poles 2i, 2j so as to serve as a plane of projection for a projector 8 that is hung from a beam 3g. Here, note that in consideration of a load applied to the beam 3g by the weight of this projector 8, beams 3h, 3i are arranged between the beam 3g and the beam 3d for the purpose of enforcement. Also, a signal to the projector 8 is provided by a computer that is received in the shelf 6.

[0022] Thus, the spatial structure 1 is constructed by properly combining poles, beams, and small beams in accordance with the purpose of use in such a manner that information equipment such as the computer, the projector 8, etc., can be built into the spatial structure 1. Accordingly, the spatial structure 1 is not limited to the one shown in Fig. 1, but can be properly designed in accordance with the individual purposes of use. The detailed structures of the poles, the beams, and the small beams will be described below.

[0023] First of all, an explanation of the poles 2 will be made based on Fig. 2 and Fig. 3. Fig. 2 is an external view of a pole 2, and Fig. 3 is a cross sectional view of the pole 2. The pole 2 has a cross-sectional configuration evenly divided into four pieces. A plurality of partitions 21 extend radially from a central portion or core 20 to form vertices P of a square in cross section of the pole 2, and walls 22 extend from each vertex P toward adjacent vertices P. One wall 22 extending from one vertex P and another wall 22 extending from another adjacent vertex P extend up to locations just short of a mid point between these vertices P, and they are not in contact with each other. Accordingly, an opening portion 23 is formed between the opposing walls 22, 22 (hereinafter referred to as "a pair of walls 22"). In addition, a groove 24 is defined by the pair of walls 22, the adjacent partitions 21, and the central core 20. These opening portion 23 and groove 24 extend in the axial direction of the pole 2 over the entire length thereof, as shown in Fig. 2.

[0024] Further, at each vertex P in the cross section of the pole 2, there are arranged two external walls 25 which extend from that vertex P in directions outwardly of the pole 2 and orthogonal to two walls 22 connected to that vertex P. As a result, an external wall 25 extending from one vertex P is arranged in opposition to an external wall 25 that extends from another adjacent vertex P, and

a wiring groove 26 in the form of a half-closed space is formed on a surface of the pole 2 by means of the opposing external walls 25 and the pair of walls 22 connected therewith. In this wiring groove 26, there can be stored or received power cables and signal cables of the information equipment used in the spatial structure 1. In addition, the storage or reception of the cables in the wiring groove 26 might reduce the external design or appearance of the spatial structure, so in order to avoid this, a wiring cover shown in Fig. 3 may be provided so as to cover the wiring groove 26.

[0025] Next, an explanation of the beams 3 will be made based on Fig. 4 and Fig. 5. Fig. 4 is an external view of a beam 3, and Fig. 5 is a cross sectional view of the beam 3. The cross-sectional shape of the beam 3 is substantially identical with the cross-sectional shape of the pole 2. A central portion or core 30, partitions 31, walls 32 (pairs of walls 32), opening portions 33, grooves 34, and vertices Q of the beam 3 correspond to the central portion or core 20, the partitions 21, the walls 22 (pairs of wall 22), the opening portions 23, the grooves 24, and the vertices P of the pole 2, respectively, and hence a detailed description thereof is omitted.

[0026] In the beam 3, the construction of wiring grooves for storing or receiving the power cables and the signal cables of the information equipment used in the spatial structure 1 is different from that in the case of the pole 2. In the beam 3, wiring grooves 36, 38 are formed only in two directions including vertically upper and lower directions, as shown in Fig. 5. Here, note that the height of external walls 35 (i.e., the height of each external wall 35 from a corresponding vertex Q), which constitute the vertically upper wiring groove 36, is designed to be higher than the height of external walls 37 (i.e., the height of each external wall 37 from a corresponding vertex Q), which constitute the vertically lower wiring groove 38. This is because it is preferable that the wiring groove 36, which opens in the vertically upward direction when the beam 3 is assembled to the spatial structure 1, can store or receive as many cables as possible. Of course, the vertically lower wiring groove 38 can also receive cables, but in this case, the external design or appearance will be reduced, so it is preferable that a wiring cover shown in Fig. 5 be arranged so as to cover the wiring groove 38. Here, note that on horizontal surfaces of the beam 3, there are no walls formed which correspond to the external walls 35, 37, and hence no wiring groove exists.

[0027] Subsequently, an explanation of the small beams 4 will be made based on Fig. 6 and Fig. 7. Fig. 6 is an external view of a small beam 4, and Fig. 7 is a cross sectional view of the small beam 4. The cross-sectional shape of the small beam 4 is the same in the side or lateral direction as that of the beam 3, but is compressed in the vertical direction therefrom. That is, the small beam 4 is thinner in comparison with the beam 3. A central portion or core 40, partitions 41, walls 42 (pair of walls 42), opening portions 43, grooves 44, and vertices R of the small beam 4 correspond to the central por-

tion or core 30, the partitions 31, the walls 32 (pair of walls 32), the opening portions 33, the grooves 34, and the vertices Q of the beam 3, respectively. In addition, in the small beam 4, there are provided no spaces corresponding to the above-mentioned wiring grooves 26, 36, 38.

[0028] As described above, the shelf 6, which is possessed by the spatial structure 1 comprising, as its component members, the poles 2, the beams 3 and the small beams 4, is a storage or reception space to receive the information equipment or other goods or articles used in the spatial structure 1, i.e., a storage structure. Details of the shelf 6 are shown in Fig. 8. The shelf 6 is formed by fitting a total of six storage units 60, which includes two units in the side or lateral direction and three units in the vertical direction, into a rectangular parallelepiped space that is formed of two poles 2 extending vertically from the floor surface and two small beams 4 (a lower small beam 4 being not shown) horizontally connecting between the poles 2. The individual storage units 60 are units having the same size and shape, respectively.

[0029] A detailed construction of a storage unit 60 is shown in Fig. 9. The storage unit 60 is constructed by arranging a pair of horizontal panels 61 in vertical opposition to each other and a pair of vertical panels 62 in horizontal opposition to each other, and respectively connecting these panels with one another in an annular and rectangular parallelepiped shape. In addition, frames 63 (63a, 63b, 63c) with a variety of decoration purposes can be arranged on the front surface of the storage unit 60. The frame 63a is a frame used when the storage unit 60 is used as an ordinary storage space. The frame 63b is a frame into which a polarizing plate is built when a display device such as a liquid crystal display, etc., is received in the storage unit 60. The frame 63c is a frame into which a lighting system is built so as to provide lighting to objects that are to be received in the storage unit 60. These frames and other frames are selectively attached to the front surface of the storage unit 60.

[0030] In addition, regarding a vertical panel 62, a perforated vertical panel 62a may be employed, as shown in Fig. 9. Such a perforated vertical panel 62a has a plurality of through holes 62b, so upon assembly of the storage unit 60, an inner side or space and an outer side or space of the perforated vertical panel 62a are connected with each other through the through holes 62b. Accordingly, when a personal computer for use with the projector 8, etc., is received in the storage unit 60, it is possible to arrange a power cable and a signal cable from the inner side into the outer side through the through holes 62b without damaging the external appearance.

[0031] In addition, similarly, the frame 63a and other frames may be attached to a rear surface of the storage unit 60. Further, when the storage unit 60 is not opened in the rear surface, the rear surface of the storage unit 60 may be closed by fitting the back panel 64.

[0032] Here, in Fig. 10, there is shown the storage unit 60 as view from the top surface thereof. That is, the sur-

face of a horizontal panel 61 is shown. In Fig. 10, two storage units 60 are arranged side by side. The horizontal panel 61 is provided in its center with a fitting groove 70 that extends in a lateral direction (i.e., in a direction to connect the opposed vertical panels 62). In addition, a total of four positioning grooves 71, which extend in parallel to the fitting groove 70 and penetrate through the side ends of the horizontal panel 61, are arranged at the opposite sides of the fitting groove 70 two by two. Further, a vertical cover 72 for covering a vertical panel 62 is attached to the surface of the vertical panel 62 that is located at an outer side, among the surfaces of the storage unit 60.

[0033] Here, the fitting groove 70 is sized and shaped in such a manner that the small beams 4 in the form of the components of the spatial structure 1 can be fitted into the fitting groove 70. Accordingly, the width of the fitting groove 70 is slightly larger than the width of each of the small beams 4, and when a plurality of storage units 60 are arranged side by side, as shown in Fig. 10, the individual fitting grooves 70 of the storage units 60 are located on a straight line. Thus, the storage units 60 are built into the spatial structure 1 by fitting one small beam 4 into the fitting groove 70 located on the straight line.

[0034] When the storage units 60 according to the present invention are arranged sideways, as shown in Fig. 10, a clearance 74 of a predetermined width is formed between the vertical panel 62 of one storage unit 60 and the vertical panel 62 of another adjacent storage unit 60. This clearance 74 is a space that can be used for a prescribed purpose, and when the storage units 60 are vertically stacked, as shown in Fig. 6, the clearance 74 also extends in the vertical direction. For example, in case where the perforated vertical panel 62a shown in Fig. 9 is used as a vertical panel of the storage unit 60, the power cables and the signal cables of the information equipment, etc., received in the storage unit 60 can be led into the clearance 74 from the through holes 62b so as to be arranged therein. By doing so, there will be no fear that the design value of the appearance of the storage structure might be deteriorated due to wiring.

[0035] In addition, unlike the case of the shelf 6 shown in Fig. 6, it is also possible to provide a horizontal cover 73 (see Fig. 11) on the surface of the horizontal panel 61 for covering thereof, similar to the vertical panel 62. Fig. 11 is a view of a storage unit 60 into which the horizontal cover 73 is built, as seen from the vertical panel 62 side (side surface). In this case, the small beams 4 are not fitted into the fitting groove 70 in the horizontal panel 61 on an upper surface of the top or uppermost storage unit, as shown in Fig. 6, but as shown in Fig. 11, astride between two storage units 60 vertically arranged one over the other, there are disposed the small beams 4 which are fitted into the fitting groove 70 in the horizontal panel 61 on the lower surface of an upper storage unit 60 and the fitting groove 70 in the horizontal panel 61 on the upper surface of a lower storage unit 60.

[0036] Here, when the horizontal cover 73 is attached to the uppermost horizontal panel 61, the positioning or registration of both of them is carried out by fitting protrusions 73a formed on the horizontal cover 73 into corresponding positioning grooves 71 formed in the uppermost horizontal panel 61. Thus, by utilizing such fitting engagement, it becomes easy to attach the horizontal cover 73 to the uppermost horizontal panel 61. Additionally, the protrusions 73a have threaded holes formed therein, respectively, and the threaded holes are formed in a direction along the positioning grooves 71.

[0037] In addition, in case where the horizontal cover 73 and the vertical cover 72 are both used for a storage unit 60, both of the covers are first mutually coupled with each other, and then attached to the storage unit 60 that has already been assembled, as shown in Fig. 12. Specifically, both of the covers are coupled with each other by passing screws from through holes 72a formed in the vertical cover 72 and threading them into threaded holes formed in the protrusions 73a, respectively, of the horizontal cover 73. Then, the attachment of both the covers to the storage unit 60 is achieved by fitting the protrusions 73 with the screws threaded therein into the positioning grooves 71, respectively.

[0038] Here, in Figs. 13 and 14, there are illustrated examples of storage structures that are constructed of an assembly of a plurality of storage units 60, horizontal covers and vertical covers which are attached to the assembly. Fig. 13 shows a storage structure in the form of a so-called commodity exhibition shelf. The frame structure of this exhibition shelf is constructed of a foundation portion in the form of a base portion 81 installed on a floor surface, two right and left vertical covers 72, a horizontal cover 73 that connects between the vertical covers 72, six small beams 4 (not shown) that connect the horizontal cover 73 and the base portion 81 with each other in the vertical direction, and three small beams 4 that connect the vertical covers 72 with each other in the horizontal direction. That is, the horizontal cover 73 and the vertical cover 72 as well contribute to the reinforcement of the storage structure in the form of the exhibition shelf. Here, note that the horizontal cover 73 or the vertical cover 72 is joined with the small beams 4 by means of appropriate joints. Also, the vertical small beams are arranged in the clearances 74 formed between adjacent storage units 60, as stated above.

[0039] With respect to such a skeleton or frame structure, a total of twenty eight storage units 60 are arranged in a matrix fashion including seven rows in the horizontal direction and four lines in the vertical direction. At this time, the horizontal small beams 4 of the frame structure are fitted into the fitting grooves 70 of the individual storage units. Here, note that as a method of assembling the small beams 4 and the individual storage units 60 of the frame structure, there can be adopted an appropriate assembly method as required which serves to facilitate the assembly procedure. Further, in this storage structure, commodities are not directly received and exhibited in

the storage units 60 built therein, but the commodities are instead exhibited on exhibition plates 80 mounted on the front surfaces of the storage units 60 on each line. That is, the storage units 60 do not perform direct storage of the commodities but instead perform indirect storage thereof.

[0040] In Fig. 14, there is illustrated a storage structure which is constructed of storage units 60 that directly store or receive objects to be stored. The skeleton or frame structure of this storage structure is constructed of two poles 2, a beam 3 that connects the poles 2 at upper locations, another beam 3 that is connected with the first-mentioned beam 3 in a T-shaped fashion. Though not illustrated, the later-mentioned beam 3 is further connected with another pole 2 so as to be supported on the floor surface.

[0041] Further, small beams (not shown) are connected between the poles 2 of the frame structure as constructed in this manner, whereby a plurality of storage units 60 are built into the frame structure, as in the case of the storage structure shown in Fig. 13, thereby forming the storage structure shown in Fig. 14. This storage structure is suitable for arrangement in a space such as an office, etc., in which a lot of people gather.

[0042] From the foregoing description, it is possible to provide storage units for use with a storage space which can be properly constructed in accordance with the purpose of use of a user, upon construction of the storage space in a spatial structure.

[0043] While the invention has been described in terms of a preferred embodiment, those skilled in the art will recognize that the invention can be practiced with modifications within the spirit and scope of the appended claims.

Claims

1. A storage unit which is in the form of a rectangular parallel-piped shape and is formed of a pair of horizontal panels and a pair of vertical panels that are connected with one another in an annular fashion, wherein each of said horizontal panels has a fitting groove extending in a lateral direction thereof into which a part of a structural member of a structural body into which said storage unit is built, and each of said horizontal panels also has a positioning groove expanding in a lateral direction thereof into which a protrusion formed on a horizontal cover covering said one horizontal panel is fitted.
2. The storage unit as set forth in claim 1, wherein each of said horizontal panels has at least two positioning grooves which are in parallel to said fitting groove.
3. The storage unit as set forth in claim 1 or 2, wherein said protrusion has a joint portion that can be con-

nected with an external member;
said vertical panels are covered with vertical covers, respectively; and
said external member is connected with said joint portion whereby said protrusion having said joint portion is fitted into said positioning groove with said vertical cover being connected with said horizontal cover.

4. The storage unit as set forth in any one of claims 1 through 3, wherein when two of said storage units are arranged side by side with their vertical panels being in opposition to each other, there is formed a clearance of a predetermined width between said vertical panels.
5. A storage structure which is formed by arranging one or a plurality of said storage units, as set forth in any of claims 1 through 4, in a horizontal direction and one or a plurality of said storage units in a vertical direction, wherein a common structural member of the storage structure is fitted into a fitting groove in a horizontal panel on an upper surface of each of one or a plurality of uppermost storage units, and another common structural member of the storage structure is fitted into a fitting groove in a horizontal panel on a lower surface of each of one or a plurality of lowermost storage units.

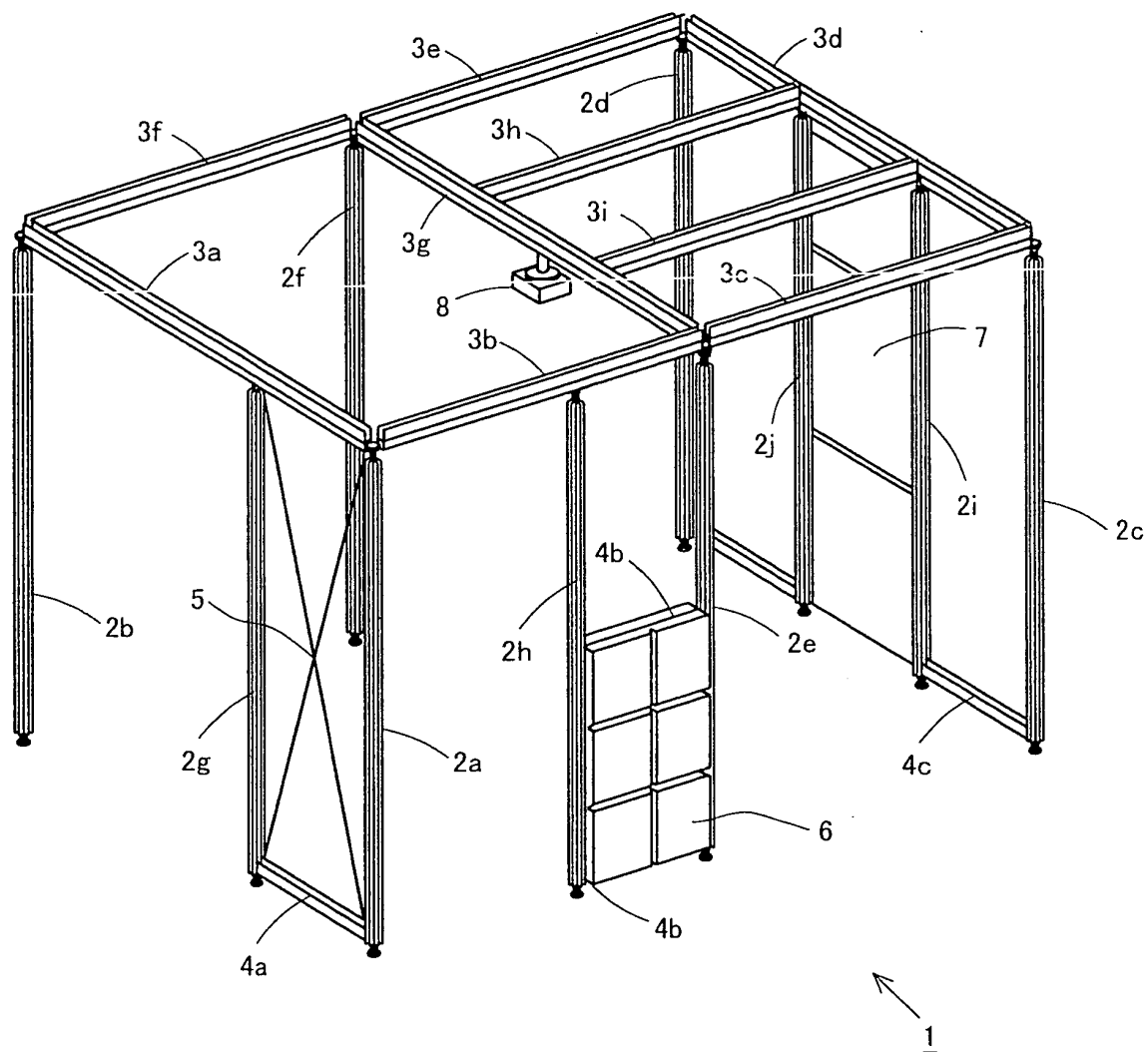


Fig.1

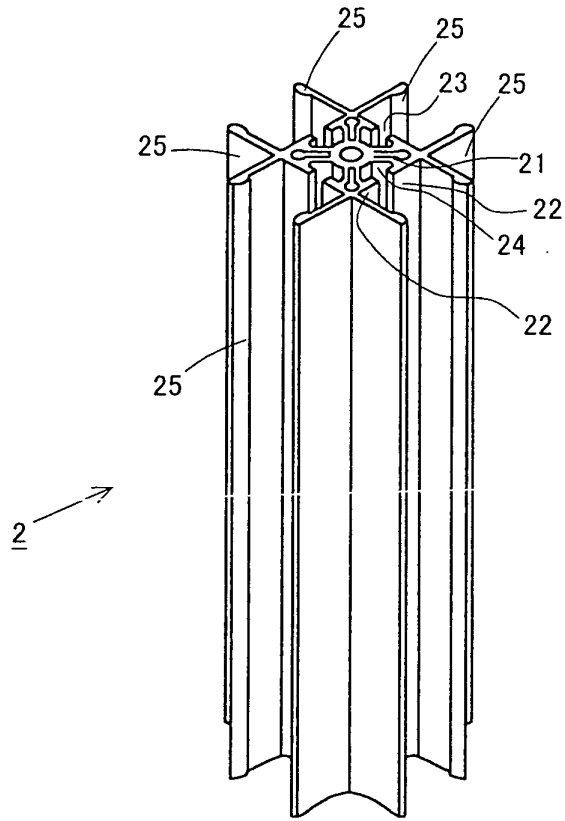


Fig.2

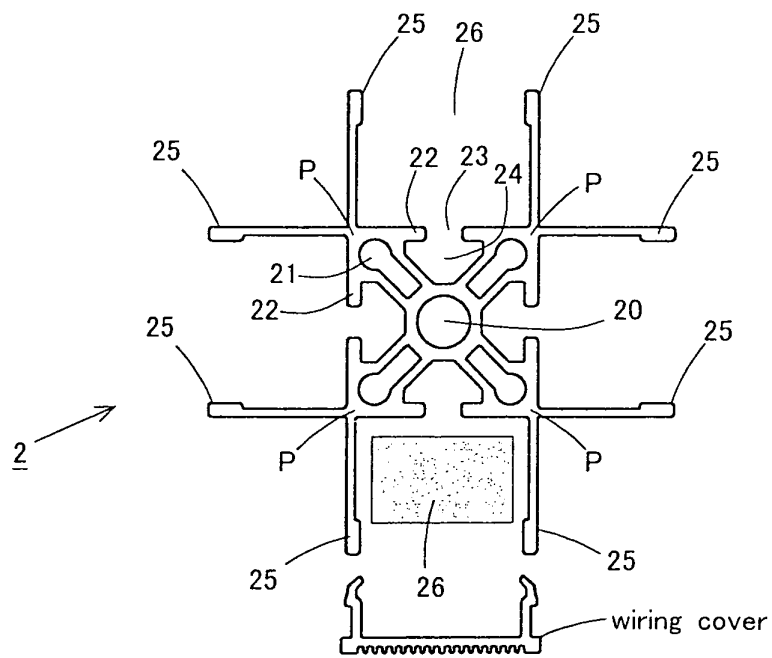


Fig.3

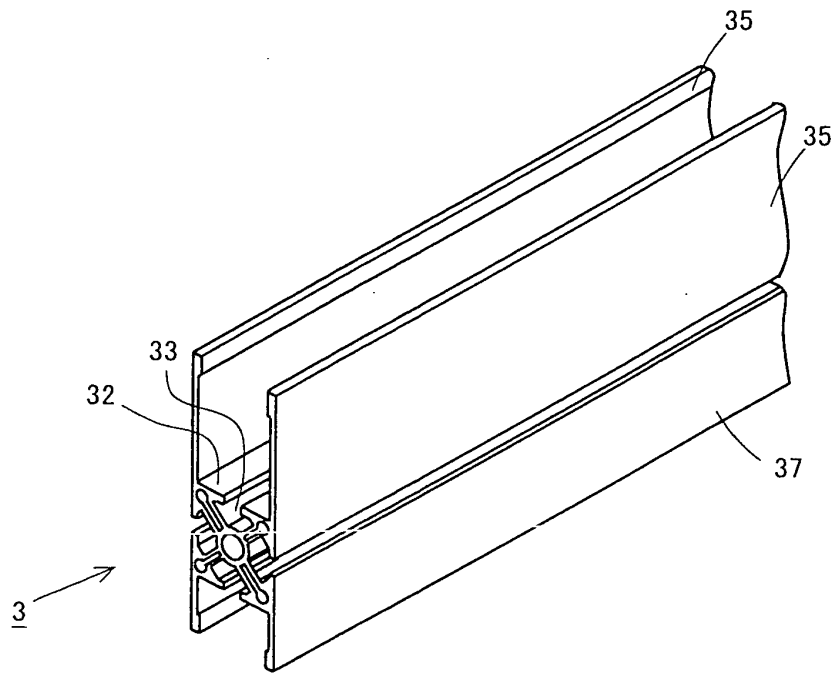


Fig. 4

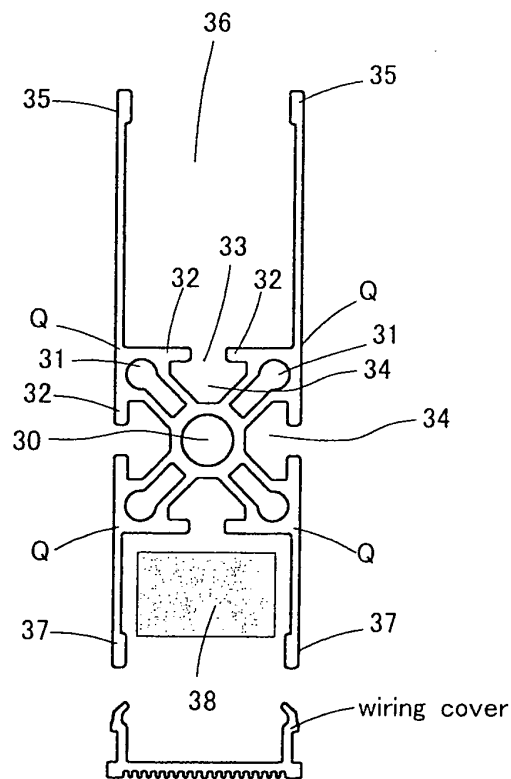


Fig. 5

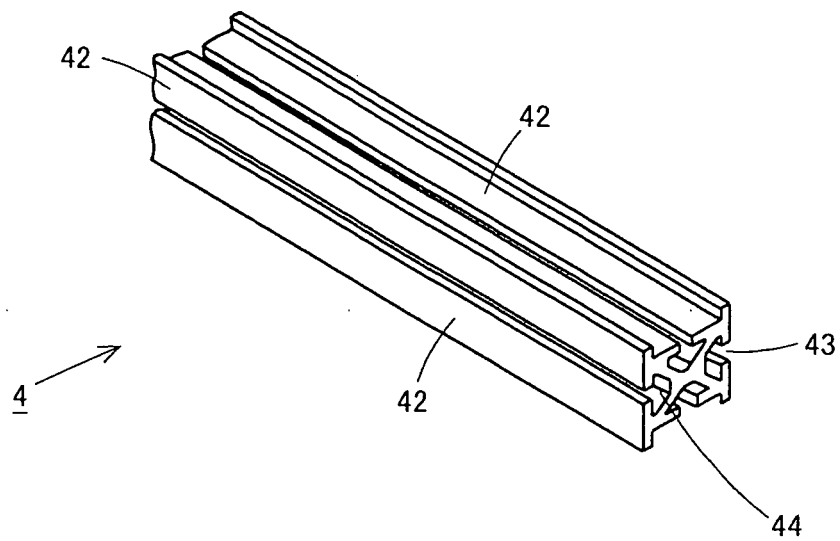


Fig.6

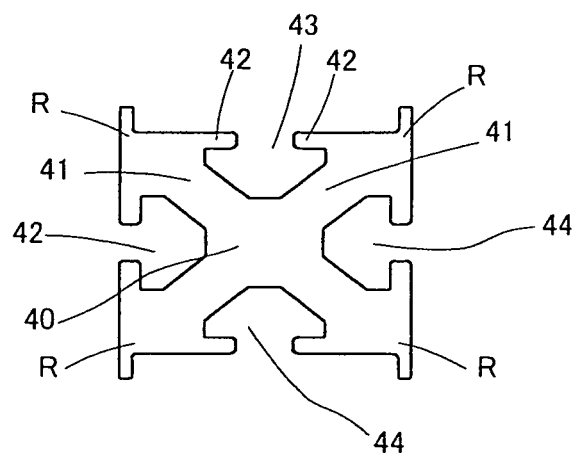


Fig.7

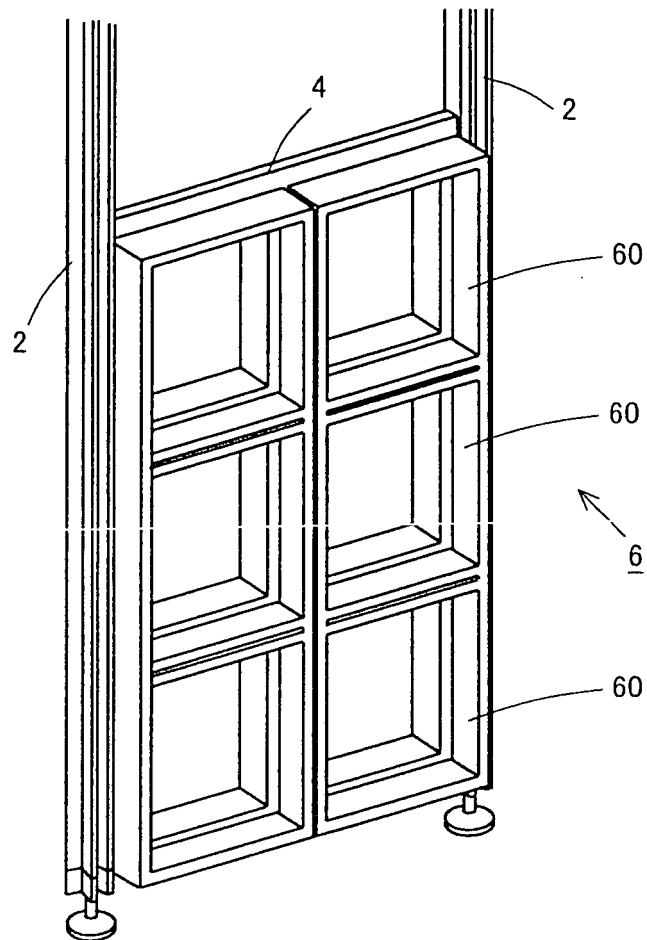


Fig. 8

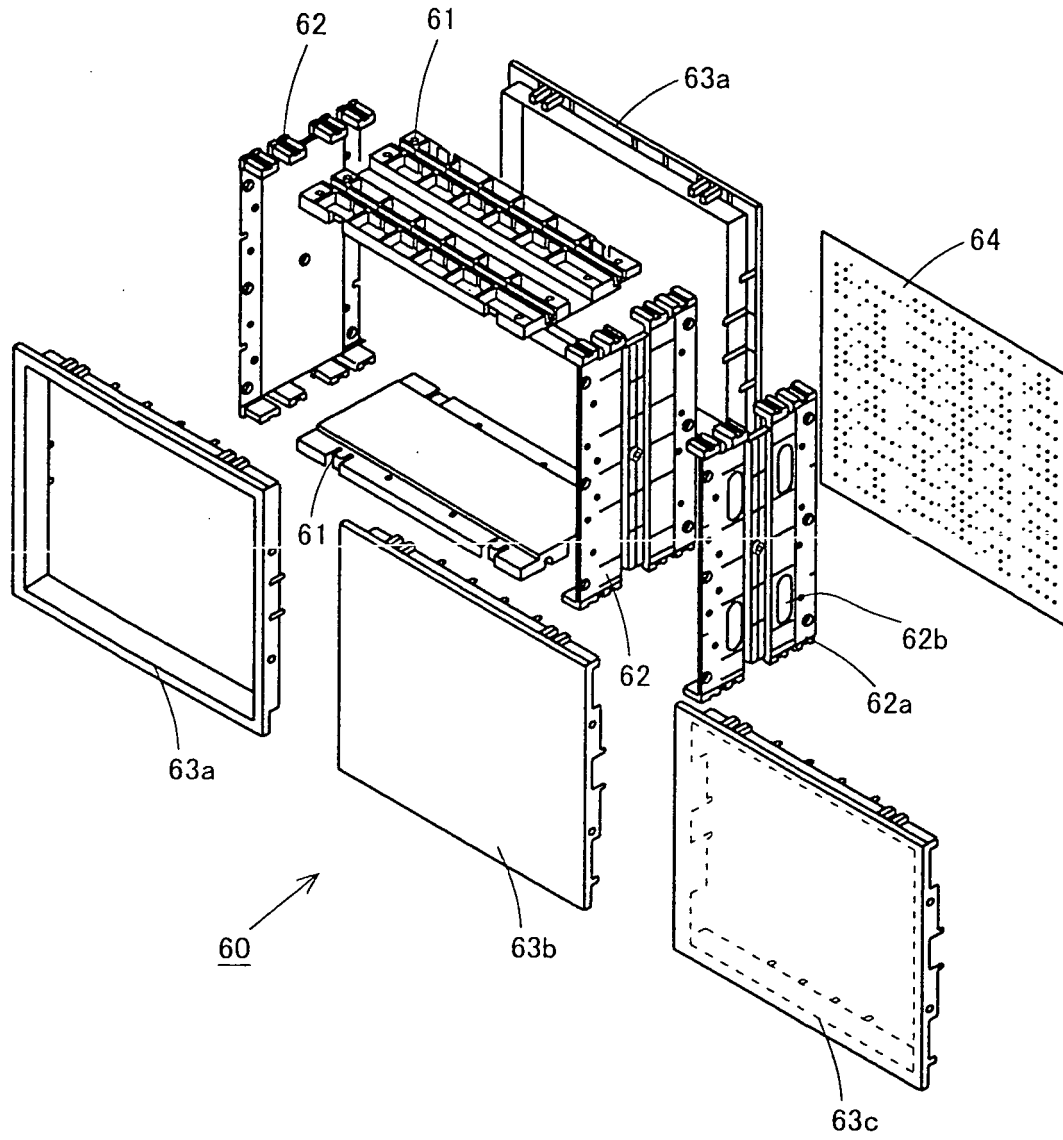


Fig.9

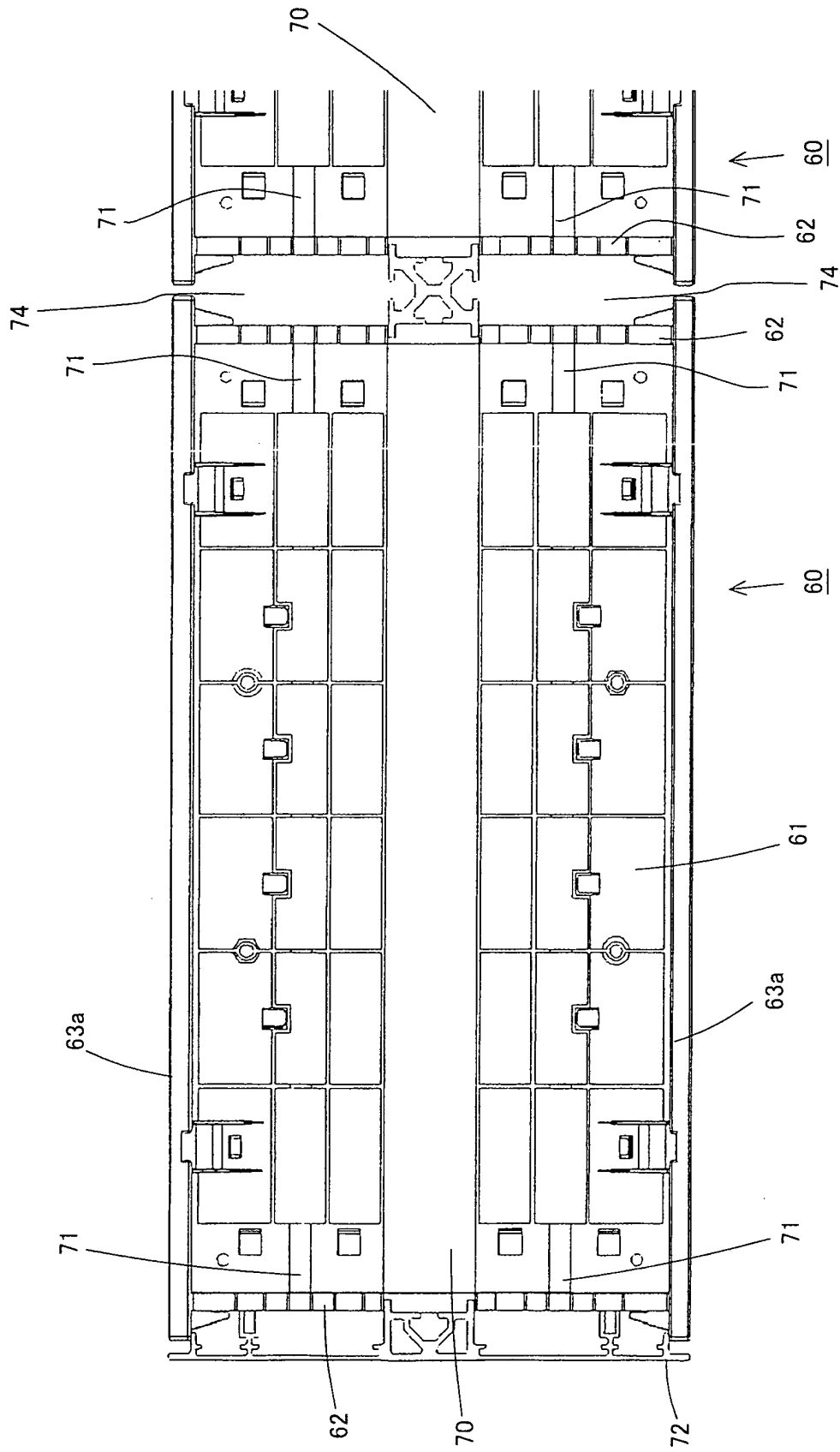


Fig.10

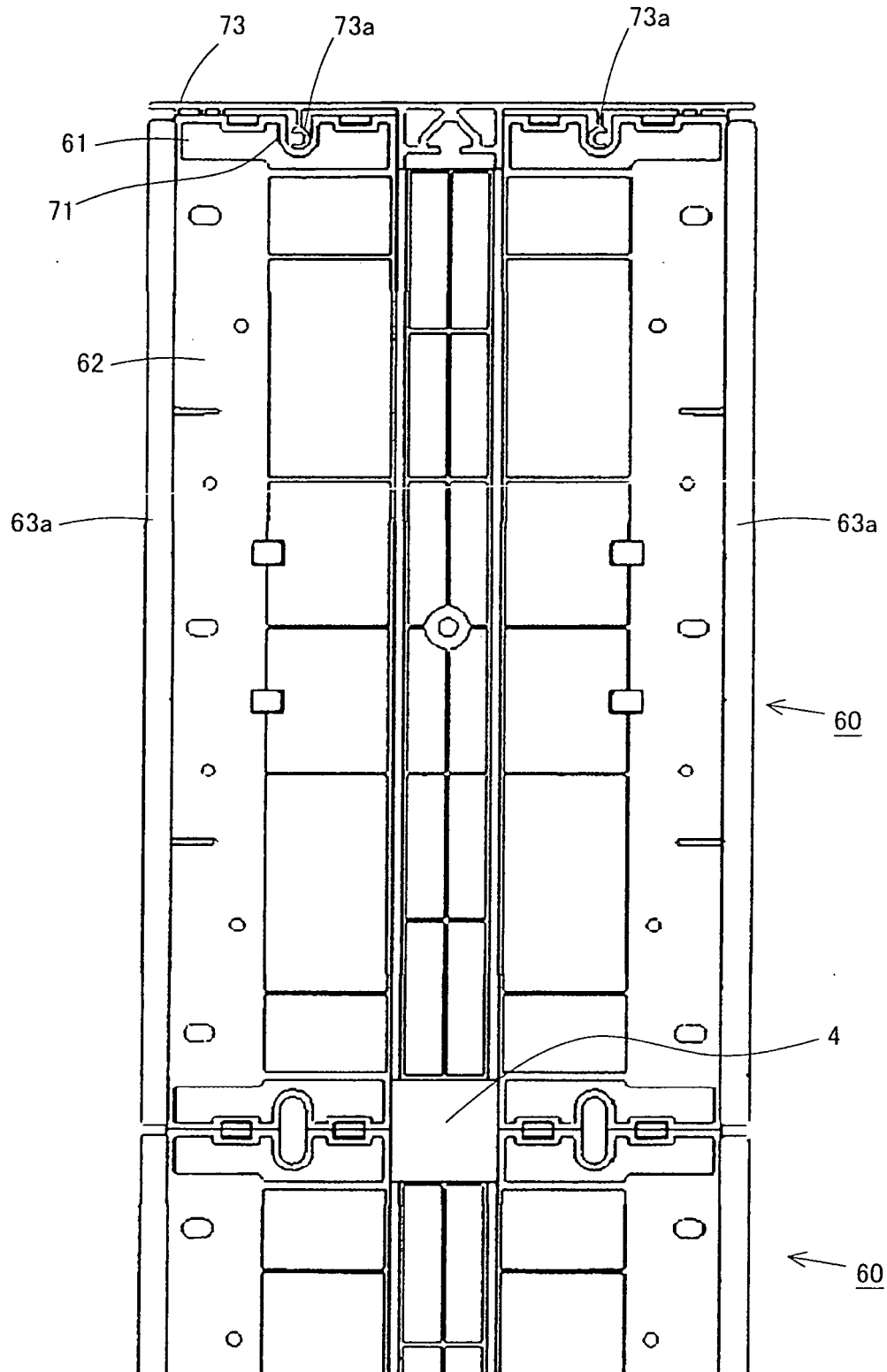
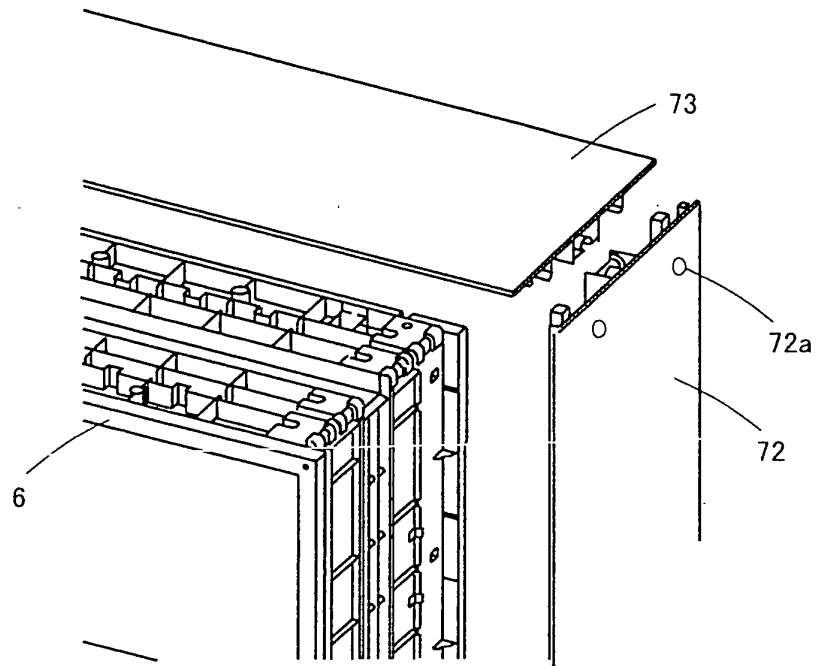


Fig.11

(a)



(b)

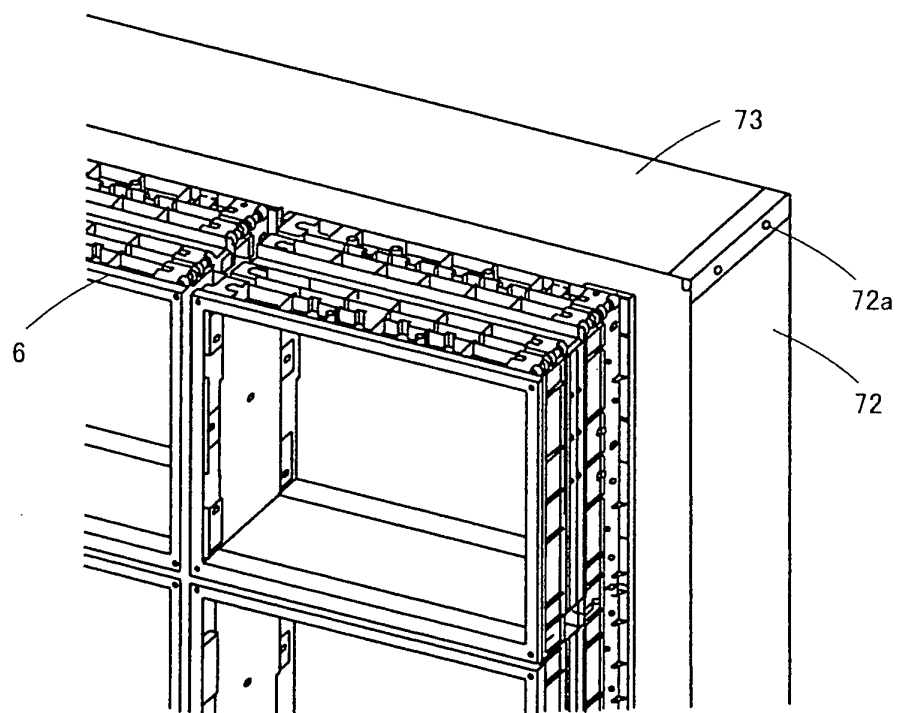


Fig.12

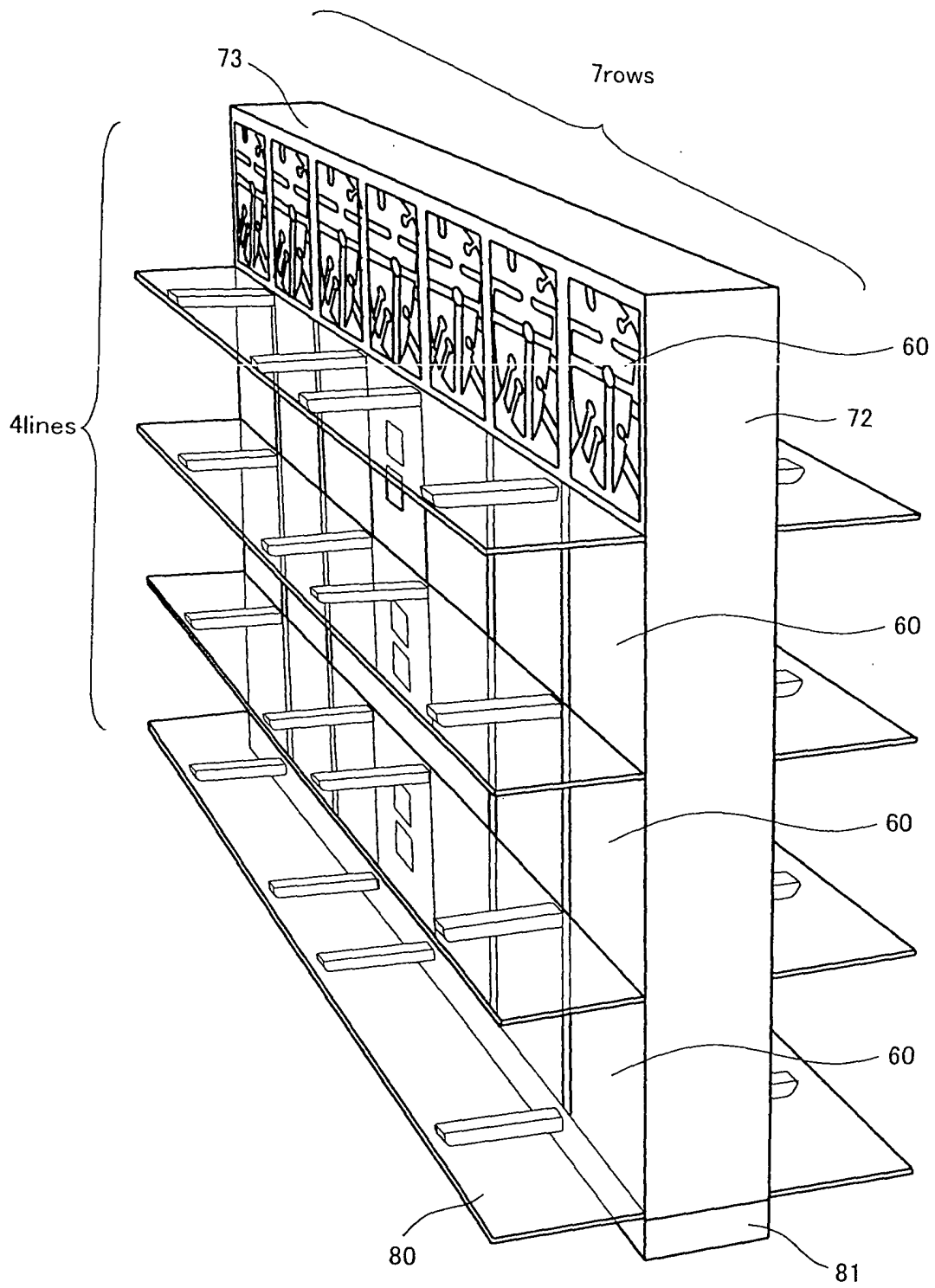


Fig.13

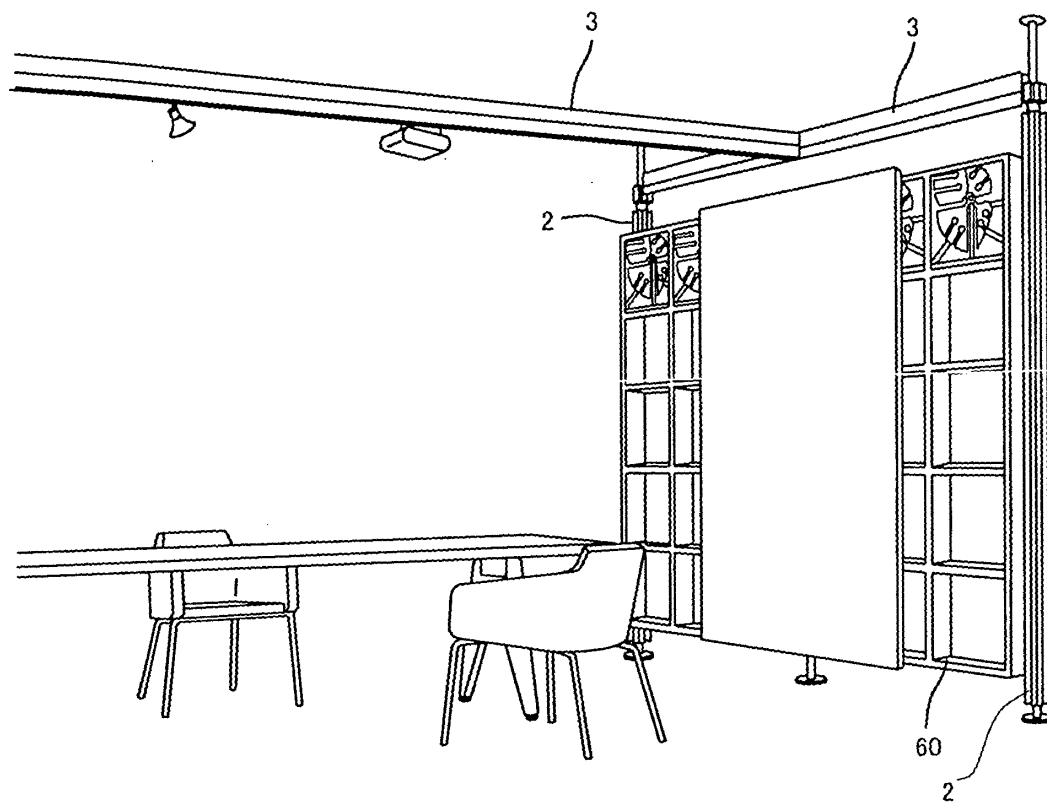


Fig.14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/308127

A. CLASSIFICATION OF SUBJECT MATTER

A47B45/00(2006.01), **A47B47/02**(2006.01), **A47B87/02**(2006.01), **E04B2/74**(2006.01), **F16B2/22**(2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47B45/00(2006.01), **A47B47/02**(2006.01), **A47B87/02**(2006.01), **E04B2/74**(2006.01), **F16B2/22**(2006.01), **F16B5/00**(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2006
Kokai Jitsuyo Shinan Koho	1971-2006	Toroku Jitsuyo Shinan Koho	1994-2006

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 102319/1991(Laid-open No. 58060/1993) (Daiken Trade & Industry Co., Ltd.), 03 August, 1993 (03.08.93), Par. No. [0013]; Fig. 2 (Family: none)	1, 2, 4, 5 3
Y	JP 54-23766 Y2 (Matsushita Electric Works, Ltd.), 14 August, 1979 (14.08.79), Full text; all drawings (Family: none)	1, 2, 4, 5

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search
08 June, 2006 (08.06.06)

Date of mailing of the international search report
20 June, 2006 (20.06.06)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/308127

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 4-49364 Y2 (Kato Hatsujo Kaisha, Ltd.), 20 November, 1992 (20.11.92), Column 4, line 11 to column 5, line 34; Fig. 1 (Family: none)	1, 2, 4, 5
Y	JP 53-40324 Y2 (Nippon Gakki Co., Ltd.), 29 September, 1978 (29.09.78), Claims (Family: none)	4

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2003138771 A [0002]
- JP 2003041689 A [0003]